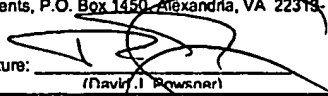


DO NOT ENTER  
ms  
05/01/2006

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as First Class Mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: February 21, 2006 Signature: 

(David I. Rowson)

1fu  
\$

Docket No.: 102323-0131  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Scott A. Thieret et al.

Application No.: 10/756,172

Confirmation No.: 2103

Filed: January 12, 2004

Art Unit: 2625

For: **IMPROVED METHODS AND APPARATUS  
FOR BACK-PROJECTION AND  
FORWARD-PROJECTION**

Examiner: M. Seth

**INFORMATION DISCLOSURE STATEMENT (IDS)**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the publications listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the publications be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed after the mailing date of a Final Office Action or Notice of Allowance, whichever occurred first, but on or before payment of the Issue Fee (37 CFR 1.97(d)). Applicant(s) hereby petition(s) that the Information Disclosure Statement be considered.

Applicant has not submitted copies of each cited U.S. patent and U.S. patent application as required by 37 CFR 1.98(a)(2)(i), amended October 2004, as the U.S. Patent and Trademark Office has waived this requirement for all U.S. patent applications. Applicant submits herewith copies of foreign and non-patents in accordance with 37 CFR 1.98(a)(2).

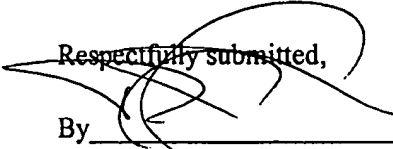
In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. In accordance with 37 CFR 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in § 1.56 (b).

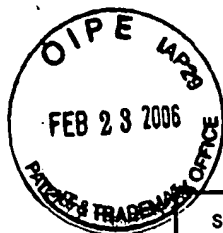
It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed publications.

Please charge our Deposit Account No. 141449 in the amount of \$180.00 covering the fee set forth in 37 CFR 1.17(p). The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 141449, under Order No. 102323-0131.

Dated: February 21, 2006

Respectfully submitted,

By   
David J. Powsner  
Registration No.: 31,868  
NUTTER MCCLENNEN & FISH LLP  
World Trade Center West  
155 Seaport Boulevard  
Boston, Massachusetts 02210-2604  
(617) 439-2717  
(617) 310-9717 (Fax)  
Attorney for Applicant



PTO/SB/08a/b (07-05)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/B/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

### Complete If Known

Application Number	10/756,172-Conf. #2103
Filing Date	January 12, 2004
First Named Inventor	Scott A. Thieret
Art Unit	2625
Examiner Name	M. Seth
Attorney Docket Number	102323-0131

Sheet	1	of	3
-------	---	----	---

### U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
	AA*	US-6,377,266	04-23-2002	Baldwin	
	AB*	US-20050152590-A1	07-14-2005	Thieret et al.	
	AC*	US-6,771,733-A1	08-03-2004	Katsevich	
	AD*	US-6,415,013	07-02-2002	Hsieh et al.	
	AE*	US-6,108,007	08-22-2000	Shochet	
	AF*	US-6,707,878-A1	03-16-2004	Claus et al.	
	AG*	US-6,731,283	05-04-2004	Navab	
	AH*	US-6,744,253-A1	06-01-2004	Stolarczyk	
	AI*	US-6,745,070-A1	06-01-2004	Wexler et al.	
	AJ*	US-6,768,782	07-27-2004	Hsieh et al.	
	AK*	US-6,778,127-A1	08-17-2004	Stolarczyk et al.	
	AL*	US-20040102688-A1	05-27-2004	Walker et al.	
	AM*	US-20040162677-A1	08-19-2004	Bednar et al.	
	AN*	US-20040147039-A1	07-26-2005	Van Der Mark et al.	
	AO*	US-20040066891-A1	08-23-2005	Freytag et al.	
	AP*	US-6,770,893-A1	08-03-2004	Nelson	
	AQ*	US-6,765,981-A1	07-20-2004	Heumann	
	AR*	US-6,744,845-A1	06-01-2004	Geoffrey Harding	
	AS*	US-6,741,730-A1	05-25-2004	Rahn et al.	
	AT*	US-6,718,195-A1	04-06-2004	Van Der Mark et al.	
	AU*	US-5,825,842	10-20-1998	Taguchi	
	AV*	US-6,324,241	11-27-2001	Besson	
	AW*	US-6,754,299-A1	06-22-2004	Patch	
	AX*	US-20050270298-A1	12-08-2005	Thieret	
	AY*	US-20030220569-A1	04-12-2005	Dione et al.	
	AZ*	US-6,747,654	06-08-2004	Laksono et al.	

### FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
	BA	-WO 04/072906 A1	08-26-2004	Ntziachristos, et al.		
	BB	-WO 04/066215 A1	08-05-2004	Grass, et al.		
	BC	-WO 01/63561 A1	08-30-2001	Kaufman, et al.		
	BD	-WO 04/034087 A2	04-22-2004	Bednar, et al.		
	BE	-WO 04/044848 A1	05-27-2004	Schlomka, et al.		
	BF	-EP 00953943 A1	07-14-2004	Heumann		
	BG	-WO 92/05507 A1	04-02-1992	Hsiao, et al.		

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. \* CITE NO.: Those application(s) which are marked with an asterisk (\*) next to the Cite No. are not supplied (under 37 CFR 1.98(a)(2)(iii)) because that application was filed after June 30, 2003 or is available in the IFW. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 801.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

Substitute for form 1449A/B/PTO				<b>Complete If Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)				Application Number	10/756,172-Conf. #2103
				Filing Date	January 12, 2004
				First Named Inventor	Scott A. Thieret
				Art Unit	2625
				Examiner Name	M. Seth
Sheet	2	of	3	Attorney Docket Number	102323-0131

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	CA	Kajiya, J. T., "Ray Tracing Volume Densities," Proc. SIGGRAPH, July 1984, Computer Graphics, Vol. 18, No. 3, pp. 165-174.	
	CB	Roettger, Stefan, et al., "Smart Hardware-Accelerated Volume Rendering," Joint EUROGRAPHICS - IEEE TCVG Symposium on Visualization, 2003, pp.231-238, 301.	
	CC	"Filtered Backprojection Reconstruction", <a href="http://www.physics.ubd.ca/~mrg/home/tutorial/fbp_recon.html">http://www.physics.ubd.ca/~mrg/home/tutorial/fbp_recon.html</a> , 2/6/2003, 5 pages	
	CD	I. Viola, et al., "Hardware Based Nonlinear Filtering and Segmentation Using High Level Shading Languages," Technical Report TR-186-2-03-07, May 2003, 8 pages.	
	CE	"Overview of X-Ray Computed Tomography," <a href="http://www.howstuffworks.com/framed.htm?parent=c...tm&amp;url=http://www.citlab.geo.utexas.edu/overview/">http://www.howstuffworks.com/framed.htm?parent=c...tm&amp;url=http://www.citlab.geo.utexas.edu/overview/</a> , 12/26/2002, 5 pages.	
	CF	DEMPSTER et al., "Maximum Likelihood From Incomplete Data Via The EM Algorithm", Harvard University and Educational Testing Service, December 8, 1976, pp. 1-38.	
	CG	Printouts from Microsoft.com, from "http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dx8_c/directx_cpp/Graphics/ProgrammersGuide/GettingStarted/Architecture," 12/20/2002, 22 pages.	
	CH	HUDSON et al., "Accelerated Image Reconstruction Using Ordered Subsets of Projection Data", IEEE Transactions on Medical Imaging, vol. 13, No. 4, December 1994, pp. 601-609.	
	CI	Chidlow, et al, "Rapid Emission Tomography Reconstruction," Proceedings of the 2003 Eurographics/IEEE TVCG Workshop on Volume Graphics, Tokyo, Japan, July 7-8, 2003, 13 pages.	
	CJ	Purcell, T., et. al., "Ray tracings on Programmable Graphics Hardware," Computer Graphics (Proceedings of SIGGRAPH), 1998, pp. 703-712.	
	CK	J. Kruger, and R. Westermann, "Acceleration Techniques for GPU-based Volume Rendering," Proceedings of IEEE Visualization, 2003, 6 pages.	
	CL	CABRAL et al., "Accelerated Volume Rendering and Tomographic Reconstruction Using Texture Mapping Hardware", Silicon Graphics Computer Systems, 1995 IEEE, pp. 91-97.	
	CM	K. Mueller, and R. Yagel, "Rapid 3-D Cone Beam Reconstruction with the Simultaneous Algebraic Reconstruction Technique (SART) Using 2-D Texture Mapping Hardware", IEEE Transactions on Medical Imaging, 12/2000, 19(12): pp.1227-1237.	
	CN	"Technical Brief: NVIDIA nfiniteFX Engine: Programmable Pixel Shaders," NVIDIA Corporation, 5 pages.	
	CO	B. T. Phong, "Illumination for Computer Generated Pictures," Communications of the ACM, 18(6), 6/1975, pp311-317.	
	CP	JONES et al., "Positron Emission Tomographic Images And Expectation Maximization: A VLSI Architecture For Multiple Iterations Per Second", Computer Technology and Imaging, Inc., 1988 IEEE, pp. 620-624.	
	CQ	H. Pfister, et. al., "The VolumePro real-time ray-casting System," Computer Graphics (Proceedings of SIGGRAPH), 8/1999, pp 251-260.	
	CR	Sandborg, Michael, "Computed Tomography: Physical principles and biohazards," Department of Radiation Physics, Faculty of Health Sciences, Linkoping University, Sweden, Report 81 ISSN 1102-1799, Sept. 1995 ISRN ULI-RAD-R-81-SE, 18 pages.	
	CS	Hadwiger, Markus, et al., "Hardware-Accelerated High-Quality Reconstruction of Volumetric Data on PC Graphics Hardware," VRVis Research Center, Vienna, Austria, and Institute of Computer Graphics and Algorithms, Vienna University of Technology, Austria, 9 pages.	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

Substitute for form 1449A/B/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)				<b>Complete If Known</b>	
				Application Number	10/756,172-Conf. #2103
				Filing Date	January 12, 2004
				First Named Inventor	Scott A. Thieret
				Art Unit	2625
				Examiner Name	M. Seth
Sheet	3	of	3	Attorney Docket Number	102323-0131

CT	N. Max, "Optical Models for Direct Volume Rendering," IEEE Transactions On Visualization and Computer Graphics, 6/1995, I(2): pp.99-108.	
CU	Viola, "Alignment by Maximization of Mutual Information," PhD Thesis MIT (Also Referred To As - "AI Technical report No. 1548"), MIT Artificial Intelligence Lab, June 1, 1995, pp. 1-29.	
CV	Hopf, M., Ertl, T., "Accelerating 3D Convolution using Graphics Hardware," Proc. IEEE Visualization, 1999, 5 pages.	
CW	Cohen, Michael, et al., "A Progressive Refinement Approach to Fast Radiosity Image Generation," Computer Graphics, Volume 22, Number 4, August 1988, pp.75-84.	
CX	"Technical Brief: NVIDIA nfiniteFX Engine: Programmable Vertex Shaders," NVIDIA Corporation, 12 pages.	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--